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ABSTRACT

This document presents a sample of the Arkansas science curriculum and identifies the content standards for physical science systems, life science systems, and Earth science/space science systems for first grade students. Each content standard is explained and includes student learning expectations, first grade benchmarks, assessments, and strategies and activities. (YDS)

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First Grade Level Science Sample Curriculum

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First Grade Level Science

STRAND 1: PHYSICAL SYSTEMS
CONTENT STANDARD 1
Students will demonstrate an understanding of physical systems as a process of inquiry.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
PS.1.1. Examine the techniques of *scientific inquiry*, problem solving, questioning, reasoning, and creative decision making by utilizing the *scientific method*	Students can group objects according to the objects' properties. Students can use simple graphs, pictures, or writings to observe, describe, or compare data. Students can work with others in a group to solve a science problem. Students will make predictions and test them.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students sort objects by characteristics and write about the reasons the students chose to group their objects as they did. Have students make predictions about whether objects will sink or float in water.
PS.1.2. Use simple equipment (microscopes), age-appropriate tools (rulers, thermometers), skills (describing and writing), technology (computers) and mathematics in scientific investigations.	Students can use science tools to examine and measure objects (hand lenses, rulers, etc.). Students count objects and write about objects they study.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Students are allowed to use simple tools to investigate objects. Students are given objects to count and write about in order to check these skills.
PS 1.3. Communicate designs, procedures, and results of scientific investigations (graphs, charts, and writings).	Students use mathematics in grouping objects. Students can distinguish between groups of objects that represent MORE from groups that represent LESS.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Students distinguish groups of more and less. Students bring in objects, such as apples and acorns, and sort and graph by color and size and create a real object graph.

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STRAND 1: PHYSICAL SYSTEMS CONTENT STANDARD 2 Students will explore, demonstrate, communicate, apply, and evaluate the knowledge of physical systems.			
Student Learning Expectations	**First Grade Benchmarks**	**Assessments**	**Strategies/Activities**
PS.2.1. Recognize the differences and similarities of *solids*, *liquids* and *gases*.	Students can recognize a solid and a liquid.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Students can recognize a solid from a liquid and give examples. Have students make baggy ice cream in the classroom. (See K-4 resource list.)
PS.2.2. Understand the physical properties of objects.	Students understand the physical properties of ice and water.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Can recognize the physical properties of ice and water. Have students observe ice melting to form water and then refreeze liquid to form ice.
PS.2.3. Learn about the physical world by observing, data collecting, using age-appropriate tools, describing, and hypothesizing.	Students, alone or in groups, can make observations and write or illustrate what they observed.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Groups of students make observations and produce joint written reports.
PS.2.4. Revise *hypothesis* by sharing and communicating observations through writing.			
PS.2.5. Explore energy changes.	Students know that heat is produced when something is burned, rubbed to produce friction, heated by the sun, or by some other heat source. Students use a thermometer to measure the amount of heat absorbed by an object.	Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Set up series of experiments to produce heat: rub hands together, shine heat lamp on hands, or feel breath in hands on a cool day. Place one cup of water in the shade and one in the sun. Measure the difference in temperature.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
PS.2.6. Identify *chemical* and *physical changes*.			
PS.2.7. Classify simple machines and relate them to inventions and discoveries.			
PS.2.8. Explore the effects of applying various types of *forces* to an object (push/pull).	Students know that the motion of an object can be changed by a push or pull.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Students push or pull toy cars and watch the cars move.

STRAND 1: PHYSICAL SYSTEMS
CONTENT STANDARD 2
Students will explore, demonstrate, communicate, apply, and evaluate the knowledge of physical systems.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
PS.2.9. Identify and compare the relationships between *mass/weight*, *force*, and *motion*.	Students examine the weight of different objects.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students guess which of several objects is heavier and then compare by picking up the objects.
PS.2.10. Examine properties, types, and uses of magnets.	Students know that magnets attract each other and other objects.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students test the reaction of magnets to objects in the classroom and discuss why certain objects are attracted to the magnets.
PS.2.11. Analyze and compare the relationship between magnets and electricity.			

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
PS.2.12. Experiment with *static* and *current electricity*.	Students experiment with static electricity.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Rub balloons to cause them to stick to clothing or rub feet on carpet to produce static sparks.
PS.2.13. Determine the relationship between vibration and sound.	Students know that vibrations in objects can be felt.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Students can hear and feel electric pencil sharpeners, motors, computers, etc. when they are activated.
PS.2.14. Explore the properties of light (e.g., *reflection, refraction, absorption, translucent, transparent,* and opaque).	Students explore that light can pass through some objects and not others. Students can name appropriate colors.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students view various teacher-selected objects that allow light through. Have students name and identify various colors.

STRAND 1: PHYSICAL SYSTEMS
CONTENT STANDARD 3
Students will demonstrate an understanding of the connections and applications of physical science.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
PS.3.1. Understand that physical science is interwoven into the structure of all disciplines.	Students can illustrate how light and sound are used in their lives each day.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Demonstration Log/Journal Essay Writing	Have students brainstorm all the things they use everyday that require light and sound.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
PS.3.2. Recognize that mathematics is the basis of communication in physical science.	Students can read number symbols and number words. Students can count the members in a small group of objects.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Read a simple science passage with numerical data. Have students estimate how many objects (pennies, etc.) are in a jar.
PS.3.3. Understand that tools allow tasks to be done more easily.			
PS.3.4. Explore physical science related careers.			

STRAND 2: LIFE SCIENCE SYSTEMS CONTENT STANDARD 1 Students will demonstrate an understanding of life science as a process of inquiry.			
Student Learning Expectations	**First Grade Benchmarks**	**Assessments**	**Strategies/Activities**
LS.1.1. Utilize the *scientific method* to investigate life sciences.	Students can group objects according to the objects' properties. Students can use simple graphs, pictures, or writings to observe, describe, or compare data. Students can work with others in a group to solve a science problem. Students will make predictions and test them.	Statewide Test Teacher-made Test Teacher Observation Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students group plastic insects or other plastic animals. Measure and graph the heights of all students in the class. Wet several different kinds of paper towels and test to see which is stronger by support different wieghts. Have students predict what type of plant will be produced when a seed is planted.
LS.1.2. Select age-appropriate equipment and utilize technology and mathematics in the inquiry of life science.	Students can use science tools to examine and measure objects (hand lenses, rulers, etc.). Students count objects and write about objects they study.	Statewide Test Teacher-made Test Teacher Observation Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students observe with a hand lens and measure objects gathered from the playground (acorns, leaves, rocks, etc.) and then write about these objects.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
LS.1.3. Generate graphs, writings, and charts to communicate life science investigations.	Students use mathematics in grouping objects. Students can distinguish between groups of objects that represent MORE from groups that represent LESS.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students measure cubes and sort by size. Have students sort flowers by those with more petals and those with fewer petals.

STRAND 2: LIFE SCIENCE SYSTEMS CONTENT STANDARD 2 **Students will explore, demonstrate, communicate, apply and evaluate the knowledge of life systems.**			
Student Learning Expectations	**First Grade Benchmarks**	**Assessments**	**Strategies/Activities**
LS.2.1. Identify and compare characteristics of living and nonliving things.	Students can identify living and nonliving objects.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students compare living and nonliving objects by using a Venn diagram.
LS.2.2. Explore cells in *organisms*.	Students know that there are things too small to be seen by the naked eye.	Statewide Test Teacher-made Test Teacher Observation Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students look through a magnifying lens, microscope, or Flexcam.
LS.2.3. Identify and investigate the functions of body systems in *organisms*.	Students can name interior body organs in people and animals. Students can name the exterior parts of plants.	Statewide Test Teacher-made Test Teacher Observation Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Draw outlines of people and common pets and have students place cutout drawings of organs within the outlines. The same can be done with common plants.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
LS.2.4. Recognize patterns and characteristics of *organisms*.	Students know selected characteristics of plants and animals (shape, size, color, etc.).	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students play "I'm Thinking About." The thinker names a trait of an animal and the class guesses the animal.
LS.2.5. Explore the life cycles of *organisms*.	Students can name ways living things change and grow over time (seed to flowering plant, tadpole to frog).	Statewide Test Teacher-made Test Teacher Observation Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Try to grow tadpoles to frogs, caterpillars to butterflies, or seeds to plants in the classroom.
LS.2.6. Name some common animals that no longer exist (e.g., dinosaurs and mammoths)	Students can name common wildlife animals and what these animals need in order to survive.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Name common animals (i.e., bears, deer, fish, birds, snakes, etc.) and their needs (air, food, water, and shelter).
LS.2.7. Understand that offspring are similar to their parents.	Students understand that they are similar but not identical to their biological parents.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	With parents' permission, select six students and compare pictures of themselves and each of their parents. If this is not possible, have them compare their pet offspring to its parents.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
LS.2.8. Identify the features of plants and animals that enable them to live in different environments.	Students can name features unique to birds, fish, bears, frogs, cows, pine trees, cacti, roses, and water lilies.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Play a game similar to Bingo by having students identify specific pictured animals and plants by the unique features announced by the game leader/teacher.
LS.2.9. Define and describe a *food chain* and a *food web*.	Students can name common food chains.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students arrange pictures of plants and animals into simple food chains.
LS.2.10. Understand that *organisms* are interdependent.	Students know that plants produce oxygen and food for animals.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Brainstorm ways humans use plants. Shine a light on Elodea under water in an aquarium. Watch oxygen bubbles form on the leaves. Watch the fish eat the Elodea.

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STRAND 2: LIFE SCIENCE SYSTEMS CONTENT STANDARD 3 Students will demonstrate an understanding of the connections and applications in life sciences.			
Student Learning Expectations	**First Grade Benchmarks**	**Assessments**	**Strategies/Activities**
LS.3.1. Understand that life sciences are interwoven into all disciplines.	Students can draw and paint how plants and animals interact each day.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students create scenes of animals pollinating plants, eating plants, etc.
LS.3.2. Recognize that mathematics is the basis of communication in life science.	Students can read number symbols and number words. Students can count the members in a small group of objects.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students read counting books. Count the petals on a daisy or aster or any multiple petal flower.
LS.3.3. Identify that humans change environments in ways that can be beneficial or detrimental for themselves and other *organisms*.	Students can name some forms of pollution that is produced by man. Students can identify ways that people can conserve resources.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students categorize trash collected on the school grounds. Have students create lists of ways they can practice conservation.
LS.3.4. Explore careers related to life sciences.	Students can identify medical professions as careers in the life sciences,	Statewide Test Teacher-made Test Teacher Observation Exhibition Demonstration Log/Journal Essay Writing	Invite speakers into the classroom.

STRAND 3: EARTH/SPACE SYSTEMS CONTENT STANDARD 1 Students will demonstrate an understanding of the inquiry process through the study of earth and space systems.			
Student Learning Expectations	**First Grade Benchmarks**	**Assessments**	**Strategies/Activities**
ES.1.1. Utilize the *scientific method* to investigate earth/space systems.	Students can group objects according to the objects' properties. Students can use simple graphs, pictures, or writings to observe, describe, or compare data. Students can work with others in a group to solve a science problem. Students will make predictions and test them.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students gather different marbles or other objects, describe the properties, and sort the objects into groups. Have students work in groups to solve a problem presented by the teacher. Have students make predictions about weather and seasons.
ES.1.2. Select appropriate equipment and utilize technology and mathematics in the inquiry of earth/space systems.	Students can use science tools to examine and measure objects (hand lenses, rulers, etc.). Students count objects and write about objects they study.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students count the grains of sand or salt using a hand lens and describe the shape of the sand or salt. Have students measure objects in the classroom and write about the importance of measurement.
ES.1.3. Generate graphs, writings, and charts to communicate earth/space systems investigations.	Students use mathematics in grouping objects. Students can distinguish between groups of objects that represent MORE from groups that represent LESS.	Statewide Test Teacher-made Test Teacher Observation Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Students can use appropriate math in grouping their MORE and LESS groups.

STRAND 3: EARTH/SPACE SYSTEMS

CONTENT STANDARD 2
Students will explore, demonstrate, communicate, apply and evaluate knowledge of the properties of earth and space systems.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
ES.2.1. Recognize and classify different types of earth materials.	Students can identify and differentiate soil from rock. Students can recognize rocks and sort them into groups based on physical properties.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Compare the size of sand, humus, and clay with the size of various rocks. Have students sort rocks based on color, texture, hardness, size, etc.
ES.2.2. Describe major features of the earth's surface and how it is affected by natural changes.	Students can identify soil erosion on school grounds.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Hike the playground and locate erosion spots.
ES.2.3. Identify the natural divisions of Arkansas.	Students can identify mountains, valleys, lakes, streams, and rivers in Arkansas.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students identify mountains, lakes, streams, and rivers from their own or someone else's pictures or drawings.
ES.2.4. Understand that the Earth is layered (*crust, mantle, and core*).	Students understand that as we travel deeper into the Earth it becomes hotter.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Research the Internet about deep mines and how the temperature rises and read the story to students.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
ES.2.5. Investigate seasonal changes in weather and factors that affect weather conditions.	Students know that weather conditions occur in patterns over time. (Some days it rains and some days it is sunny. It is cooler in the winter and warmer in the summer.)	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students keep a daily record of weather patterns and of seasonal changes.
ES.2.6. Describe the water cycle.	Students watch teacher demonstrations of water changing from liquid to steam and from liquid to solid and can predict what water will do when cooled or heated enough to cause a change.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	View teacher demonstration of heating water to steam and cooling water to ice.
ES.2.7. Discuss land forms in the ocean and how they change.	Students understand that 75% of the surface of the Earth is covered by water.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Using a world globe, students roughly figure the percent of the world covered by water.
ES.2.8. Analyze the features and motions of the sun, moon, earth and other celestial bodies (e.g., *solar system*, moon phases, *earth's rotation* and *revolution*).	Students can recognize the sun, moon, and stars.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	The teacher reads poems or nursery rhymes that describe the sun, moon, and stars. Students then illustrate them.

STRAND 3: EARTH/SPACE SYSTEMS CONTENT STANDARD 3 Students will demonstrate an understanding of the connections and applications of earth and space systems.			
Student Learning Expectations	**First Grade Benchmarks**	**Assessments**	**Strategies/Activities**
ES.3.1. Understand and appreciate the uses of water.	Students can describe why plants and animals need water.	Statewide Test Teacher-made Test Teacher Observation Portfolio Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students illustrate why plants and animals need water.
ES.3.2. Describe uses and conservation of materials taken from the earth.	Students can identify ways that people can conserve resources.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students brainstorm ways to conserve mineral resources.
ES.3.3. Identify the effect humans have on the environment (e.g., use and misuse).	Students can name some forms of pollution produced by man. Students can identify ways that people can conserve resources.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students brainstorm forms of pollution in their region of the state and ways to conserve resources.
ES.3.4. Understand how earth/space systems connect to other disciplines.	Students can illustrate how weather affects their lives each day.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students make drawings and paintings of how weather affects our lives each day.

Student Learning Expectations	First Grade Benchmarks	Assessments	Strategies/Activities
ES.3.5. Recognize the importance of mathematics as the basis of communication in earth/space systems.	Students can read number symbols and number words. Students can count the members in a small group of objects.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students count rocks and sort them into groups and write the number symbols for each group.
ES.3.6. Use age-appropriate equipment, tools, techniques, technology, and mathematics in *scientific investigation* of earth/space systems.	Students can use science tools to examine and measure objects (hand lenses, rulers, etc.). Students count objects and write about objects they study.	Statewide Test Teacher-made Test Teacher Observation Portfolio Checklist Performance-based Test Exhibition Demonstration Log/Journal Essay Writing	Have students use the tools of science to study rocks (hand lenses, rulers, magnifiers, etc.). Have students count and write about rocks.
ES.3.7. Explore careers related to earth/space science.			

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